

### Amendments To The Claims

Please cancel claims 1-79 without prejudice.

#### **Listing of Claims:**

1 - 79 (Canceled without prejudice)

80. (New) A method for conducting an electrochemiluminescence binding assay for detecting or measuring an analyte of interest in a sample comprising:

- (a) contacting an assay electrode with a sample and a component of said assay linked to an electrochemiluminescent label, said assay electrode:
  - (i) comprising a composite containing a polymer matrix and a multiplicity of carbon particles dispersed therein; and
  - (ii) having a binding domain containing a binding reagent, wherein said binding reagent is immobilized on said electrode;
- (b) applying a voltage waveform effective to trigger electrochemiluminescence at said binding domain in the presence of a reaction medium suitable for conducting an electrochemiluminescence assay; and
- (c) detecting or measuring electrochemiluminescence from said binding domain;  
wherein said detected or measured electrochemiluminescence correlates to the presence or amount of said analyte in said sample.

81. (New) The method of claim 80, wherein the carbon particles comprise from 0.5% to 50% by weight of the composite.

82. (New) The method of claim 80, wherein the carbon particles comprise from 1% to 30% by weight of the composite.

83. (New) The method of claim 80, wherein said binding reagent is covalently bound to said assay electrode.

84. (New) The method of claim 80, wherein said binding reagent is non-covalently bound to said assay electrode.

85. (New) The method of claim 80, wherein said binding reagent is directly immobilized on said assay electrode.

86. (New) The method of claim 80, wherein said binding reagent is indirectly immobilized on said assay electrode via a binding pair.

87. (New) The method of claim 80, wherein said assay electrode includes at least one additional binding domain.

88. (New) The method of claim 80, wherein said binding reagent comprises an antibody or fragment thereof, a nucleic acid, a receptor or an enzyme.

89. (New) The method of claim 80, wherein said electrode comprises one or more additional binding domains having different binding specificities to provide for simultaneous binding of a plurality of different analytes of interest present in said sample.

90. (New) The method of claim 80, wherein said sample is a metered volume of sample.

91. (New) The method of claim 80, further including a wash step.

92. (New) The method of claim 80, further including a calibration step.

93. (New) The method of claim 80, wherein one component of the assay is stored in

dry form and reconstituted by the sample.

94. (New) The method of claim 80, wherein said voltage is applied to two of said electrodes at different times.

95. (New) The method of claim 80, wherein said reaction medium includes an ECL coreactant.

96. (New) The method of claim 80, wherein said electrochemi-luminescent label is capable of repeatedly emitting electrochemiluminescence.

97. (New) The method of claim 80, wherein said electrochemi-luminescent label comprises a metal.

98. (New) The method of claim 80, wherein said electrochemi-luminescent label comprises an organometallic compound.

99. (New) The method of claim 80, wherein said electrochemi-luminescent label comprises an organometallic compound selected from the group consisting of Ru-containing and Os-containing organometallic compounds.

100. (New) The method of claim 80, wherein, when said sample comprises said analyte, said contacting step results in the formation of a sandwich complex comprising said binding reagent, said analyte and said component.

101. (New) The method of claim 80, wherein said analyte competes with said component for binding to said binding reagent.

102. (New) The method of claim 80, wherein said analyte competes with said binding reagent for binding said component.

103. (New) The method of claim 80, wherein said analyte binds to said binding

reagent.

104. (New) The method of claim 80, wherein said analyte binds said component.

105. (New) The method of claim 80, wherein said analyte binds said binding reagent and said component.

106. (New) A method for conducting electrochemiluminescence binding assays for detecting or measuring a plurality of analytes of interest in a sample comprising:

- (a) contacting an assay electrode with a sample and one or more assay components linked to electrochemiluminescent labels, said assay electrode:
  - (i) comprising a composite containing a polymer matrix and a multiplicity of carbon particles dispersed therein; and
  - (ii) having a plurality of binding domains containing binding reagents, wherein said binding reagents are immobilized on said electrode;
- (b) applying a voltage waveform effective to trigger electrochemiluminescence at said binding domains in the presence of a reaction medium suitable for conducting an electrochemiluminescence assay; and
- (c) detecting or measuring electrochemiluminescence from said binding domains;  
wherein said detected or measured electrochemiluminescence at said binding domains correlates to the presence or amount of said analytes in said sample.

107. (New) The method of claim 106, wherein at least two of said binding domains comprise binding reagents that differ in specificity for analytes of interest.

108. (New) The method of claim 106, wherein the measured electrochemiluminescence at a first of said binding domains correlates with the presence or amount of a first analyte and the measured electrochemiluminescence at a second of said binding domains correlates with the presence or amount of a second analyte.